IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Akio KONISHI

Serial No.: NEW

Filed: August 23, 2001 (herewith)

For: APPARATUS FOR FABRICATING POWDERY THERMOELECTRIC MATERIAL AND METHOD OF FABRICATING POWDERY THERMOELECTRIC MATERIAL USING THE SAME

PRELIMINARY AMENDMENT

Honorable Commissioner
of Patents and Trademarks
Washington, D.C. 20231

August 23, 2001

Dear Sir:

Prior to an examination on the merits, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please replace the paragraph at page 10, lines 14-23, with the following rewritten paragraph:

-- At first, a starting (or raw) material having a predetermined composition is weighed and is enclosed in a vessel 1 (step S1). The starting (or raw) material of the thermoelectric material contains, for example, antimony (Sb) or bismuth (Bi) being a group V element and Selenium (Se) or tellurium

(Te) being a group VI element. Since the solid solution of the group V and group VI elements has a hexagonal system (crystal) structure, at least two of elements among Bi, Te, Sb and Se are used as the raw materials generally represented as follows: --

Please replace the paragraph beginning at page 11, line 8, with the following rewritten paragraph:

-- Then, the starting or raw material enclosed in the vessel 1 is heat-melted by a radio frequency coil or a heater or the like (step S2). Further, the molten metal of the heat-melted raw material is poured through the funnel 2 on the rotating disk 3 (step S3). The rotating disk 3 is connected with the motor 4 and controlled for the rotational speed. The poured molten metal 5 is scattered by the rotating disk (step S4). The scattered molten metal 6 is cooled, dropped in the chamber 8, and then collected in the powder collecting portion (unit) 7 (step S5). For the method of pouring in step S3, the molten metal may be dripped dropwise or may be flowed continuously from a pouring port. --

Please replace the paragraph at page 12, lines 18-21, with the following rewritten paragraph:

-- The Figure of Merit Z indicating the performance of the thermoelectric material is represented by means of Seebeck coefficient α, electric conductivity σ, and thermal conductivity κ, as follows: --

Please replace the paragraph beginning at page 12, line 3 from the bottom, with the following rewritten paragraph:

-- When the Figure of Merit Z is higher, the performance of the thermoelectric material is better. The thermoelectric material is generally prepared from a sintered material and the heat conductivity can be decreased by reducing the crystal grain size of the sintered material finer. Accordingly, when the sintered material is prepared by using a fine powdery thermoelectric material fabricated in accordance with this invention, a thermoelectric material of a high Figure of Merit can be fabricated. That is, the performance of the thermoelectric material can be improved and the productivity of the high performance thermoelectric material can be improved. --

REMARKS

Applicant's specification was amended to correct editorial matters. Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached pages are captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE."** Early consideration and allowance of Claims 1-4 are respectfully requested.

In the event any additional fees are due, please charge our Deposit Account No. 22-0256.

Respectfully submitted,
VARNDELL & VARNDELL, PLLC
(formerly Varndell Legal Group)

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph at page 10, lines 14-23, was amended as follows:

-- At first, a [raw] starting (or raw) material having a predetermined composition is weighed and is enclosed in a vessel 1 (step S1). The [raw] starting (or raw) material of the thermoelectric material contains, for example, antimony (Sb) or bismuth (Bi) being a group V element and Selenium (Se) or tellurium (Te) being a group VI element. Since the solid solution of the group V and group VI elements has a hexagonal system (crystal) structure, at least two of elements among Bi, Te, Sb and Se are used as the raw materials generally represented as follows: --

The paragraph beginning at page 11, line 8, was amended as follows:

-- Then, the starting or raw material enclosed in the vessel 1 is heat-melted by a radio frequency coil or a heater or the like (step S2). Further, the molten metal of the heat-melted raw material is poured through the funnel 2 on the rotating disk 3 (step S3). The rotating disk 3 is connected with the motor 4 and controlled for the rotational speed. The poured molten metal 5 is scattered by the rotating disk (step S4). The scattered molten metal 6 is cooled, dropped in the chamber 8, and then collected in the powder collecting portion (unit) 7 (step S5). For the method of pouring in step S3, the molten metal may be dripped dropwise or may be flowed continuously from a pouring port. --

The paragraph at page 12, lines 18-21, was amended as follows:

-- The [figure] <u>Figure</u> of Merit Z indicating the performance of the thermoelectric material is represented by means of Seebeck coefficient α, electric conductivity σ, and thermal conductivity κ, as follows: --

The paragraph beginning at page 12, line 3 from the bottom, was amended as follows:

-- <u>When the</u> Figure of Merit Z is higher, the performance of the thermoelectric material is better. The thermoelectric material is generally prepared from a sintered material and the heat conductivity can be decreased by reducing the crystal grain size of the sintered material finer. Accordingly, when the sintered material is prepared by using a fine powdery thermoelectric material fabricated in accordance with this invention, a thermoelectric material of a high Figure of Merit can be fabricated. That is, the performance of the thermoelectric material can be improved and the productivity of the high performance thermoelectric material can be improved. --